AVIAN COCCIDIOSIS

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Coccidiosis is one of the most destructive diseases of young chickens. There is no accurate information concerning the loss resulting from this disease; however, it is widespread and very fatal. The disease is especially severe where a large number of birds are raised on a limited area. This does not necessarily mean that specialized poultry raising cannot be done, but it emphasizes the necessity of recognizing the importance of this problem and becoming properly informed in regard to it.

The largest losses occur in chicks from 4 to 8 weeks old. In affected flocks, from 25 to 50 per cent, and sometimes nearly all, of the chicks may die. The disease may also occur in young turkeys.

THE CAUSE OF COCCIDIOSIS

This is a single-celled, round to oval-shaped animal organism, belonging to the group of parasites known as Protozoa. These organisms are called coccidia and can be seen only with the aid of

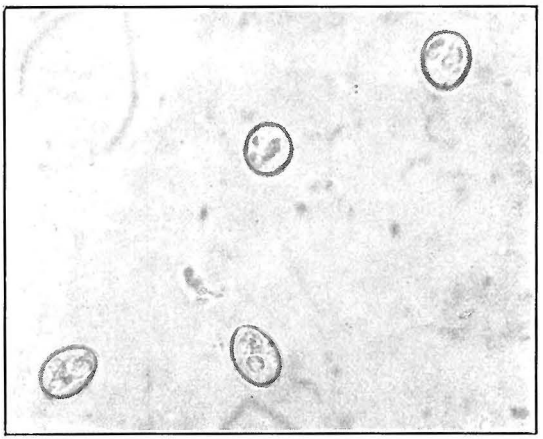

Fig. 1.—Non-sporulated oocysts

magnification. Six different species have been found in the chicken. At the present time only two of these are considered to be of serious consequence from the standpoint of producing disease.

A knowledge of the life cycle of this parasite is very important before proper methods of control and prevention can be attempted.

The organism in the oocyst stage is voided with the droppings of infected individuals. The oocyst has a protective wall which is very resistant to external conditions. The oocyst is not infective but must undergo a series of changes before it is capable of producing disease. If proper conditions of moisture, air, and temperature are present, the protoplasm of the oocyst divides into four bodies (sporoblasts), which, in turn, divide into two crescent-shaped bodies (sporozoites). At this stage in development the parasite is capable of producing disease. The time required for this development varies from 24 hours to several days, depending on conditions present.

Fig. 2.—Sporulated oocysts

The parasite gains entrance to the fowl through contaminated feed and water. The action of the intestinal juices dissolves the wall of the oocyst and liberates the sporozoites. These enter the intestinal epithelium and continue to develop, eventually destroying the invaded cell. The parasite may reproduce asexually for a number of generations without leaving the infected host. It then stops reproducing asexually and differentiates into male and female elements. These fuse to form the oocysts which are expelled with the droppings.

METHOD OF DISTRIBUTION

It is often very difficult to determine the source of infection in an outbreak of coccidiosis in a flock of chickens. The chief source of infection is contaminated soil. Apparently healthy fowls may harbor coccidia and expel oocysts in their droppings, thus contaminating the soil.

It is claimed that the parasite may pass unchanged through the intestinal tract of sparrows and flies without losing its vitality. This affords a means of distributing the disease over the country.

Transmission of coccidiosis through the hen's egg is said to occur. It is claimed that the eggs of chickens may become contaminated by excretions containing coccidia and young chicks may thus become infected soon after being hatched.

Coccidia may be carried on shoes, by flies, brooder equipment, streams, and ditches. It is also probable that they may be transmitted by grain used for feed.

SYMPTOMS OF COCCIDIOSIS

In many cases the symptoms do not differ from those observed in some other diseases, and a positive diagnosis cannot be made from symptoms alone.

Severe outbreaks of coccidiosis are often accompanied by the passage of blood-stained, watery droppings. Chicks may die suddenly without any symptoms having been noticed. If the infection is moderately severe, the chick will usually be droopy, unthrifty, and very weak. The plumage is ruffled and soiled. Chicks will usually remain separated from the flock and stand for long intervals with wings drooped and eyes closed.

Usually, the heaviest losses occur in chicks from 4 to 6 weeks of age. Older birds may be affected with this disease, but usually the losses are not serious. In chickens 6 months old or over, the most outstanding symptoms are loss of appetite, unthriftiness, diarrhea, paleness of comb and wattles, and a slow sluggish attitude in walking. In adult birds the disease is usually chronic and many recover.

APPEARANCE OF ORGANS

Changes are confined to the tissues of the intestinal tract. Hemorrhage in the caeca and lower intestine, thickening of the wall of the caeca, and a milky-like exudate in the depths of the mucous membrane indicate the acute type of coccidiosis. One or both caeca may be enlarged, but in some instances no enlargement is noticed in either. In chicks which survive for a few days, the caeca may be filled with a grayish, whitish, or yellowish, firm, cheesy-like mass.

The chronic type is characterized by the presence of numerous grayish spots in the first portion of the intestine, thickening of the middle and lower portions, and the presence of a grayish or pink-tinged exudate.

Coccidia frequently occur in flocks of apparently healthy chickens, and the mere presence of oocysts in the intestinal discharges, as determined by microscopic examination, is not always positive proof that the flock is suffering from coccidiosis. It is necessary, in establishing a diagnosis, to consider both the symptoms shown and the lesions found at post-mortem examination. Paleness of comb and wattles, emaciation, and blood-stained droppings, together with the grayish spots on the intestinal mucosa, thickening of the intestinal wall, blood-tinged exudate, and milky appearance of caecal walls are indicative of coccidiosis. These indications, supplemented by finding oocysts in the intestinal discharges, warrant a positive diagnosis.

TREATMENT

Among the measures advocated for the treatment of coccidiosis, the feeding of a ration with a high content of milk or milk sugar has been most commonly used. The idea is to change the reaction of the intestinal tract by making it more acid through the lactic acid fermentation resulting from the feeding of large amounts of milk. The usual method of giving this milk is by feeding mash containing 20 per cent milk sugar or 40 per cent dry skimmilk.

Although this method may have some value in combating coccidiosis, it is not very dependable and may be detrimental in some instances. Skimmilk in excess may cause loss of feathers, even in young birds. The chief virtue of the addition of milk to the ration is due to its nutritional qualities, producing a rapid growth, with a natural increase in resistance.

Many chemicals have been recommended to control coccidiosis, but these are of questionable value. Crude catechu has been given in the drinking water, using one gram of the powdered crude catechu to each gallon of drinking water. This medicated water is given for a period of 10 to 14 days. Other drugs, such as quinine sulphate, cinchona bark, hydrochloric acid, bichloride of mercury, powdered ipecac, and bismuth subnitrate, have been used in the drinking water or mash. None of these were found to be effective. Unless some remedy is found that is harmless to the host and at the same time destructive to the parasite, the most promising line of attack consists in control measures.

CONTROL MEASURES

Sanitation is of prime importance in combating this disease, because without adequate sanitation it is doubtful if the disease can be controlled for any considerable period of time. Sanitation should not be expected to eliminate infection totally, but will greatly reduce it.

Drying is one of the most effective means of destroying oocysts; therefore the brooders should be kept dry at all times. Overcrowding tends to cause dampness and should be avoided. The removal of droppings reduces the opportunity of ingesting oocysts. The droppings should be removed daily, because oocysts of acutely pathogenic species may sporulate in about 48 hours, or even less time. The use of brooder houses with sun porches having either wire-meshed floors or cement floors that may be easily cleaned is a great aid in controlling the disease. When chicks are allowed on the ground they should be placed on an uncontaminated plot or on old runways that have been covered with a layer of sand or cinders. Cleanliness of the feeding and drinking utensils and provision of a highly nutritional diet are very important factors in controlling the disease.

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